

IN THE CLAIMS

Claims 1-3 (Canceled).

Claim 4 (Currently Amended): A measuring apparatus for measuring an electron energy distribution in a plasma region generated by a high frequency power, comprising:

a heating probe having a probe portion which is inserted in the plasma region to be heated by application of a pulse voltage;

a pulse power supply which applies heating pulses to the heating probe to heat the probe portion to a state that the probe portion can emit thermions;

a detecting measuring section which detects a difference in floating voltage between a voltage period (H level) and a no-voltage period (L level) of the pulse voltage; and

a calculating section which obtains an electron energy distribution in the plasma region on the basis of the detected value detected by the ~~detecting~~ measuring section,

wherein the pulse power supply varies a pulse height (H level) of the pulse when applying the pulse voltage to the heating probe.

Claim 5 (Original): A measuring apparatus according to claim 4, wherein the measuring apparatus is equipped in a processing apparatus for performing one of a film forming processing, an etching processing and an annealing processing, and

the probe portion is mounted in a chamber of the processing apparatus where the plasma region is generated, in an electrically insulated state, and the heating probe is in a potentially floating state.

Claim 6 (Original): A measuring apparatus according to claim 5, wherein the chamber is made of insulating material.

Claims 7-9 (Canceled).

Claim 10 (Currently Amended): A measuring apparatus according to claim 4, further comprising:

an A/D converting section which is provided on a same substrate along with the ~~detecting~~ measuring section or on another substrate and which converts data obtained in the ~~detecting~~ measuring section to digital data;

a first signal converting section which has a function of converting an electric signal to an optical signal and vice versa and a function of performing communication and which converts the data from the A/D converting section, to an optical signal and transmits the optical signal, or converts a received optical control signal, to an electric signal; and

a second signal converting section which has a function of converting an electric signal to an optical signal and vice versa and a function of performing communication and which converts the data from the first signal converting section, to an electric signal or converts the control signal to an optical signal.

Claim 11 (Previously Presented): A measuring apparatus according to claim 4, further comprising a display section which displays a table or a graph showing the electron energy distribution obtained by the calculating section.

Claim 12 (Previously Presented): A measuring apparatus according to claim 10, which is designed to be provided in a processing apparatus for forming film, performing etching or performing annealing, by using plasma generated by application of high-frequency

power, and in which the probe is electrically insulated from the chamber of the processing apparatus, in which the plasma region is provided, and is set at a floating potential.

same as 6
Claim 13 (Previously Presented): A measuring apparatus according to claim 12, wherein the chamber is made of an insulating material.

same as 10 + 11
Claim 14 (New): A measuring apparatus according to claim 4, wherein the measuring section comprises circuit elements integrated on a substrate, and said measuring apparatus further comprises:

an A/D converting section which is provided along with the measuring section or provided on another substrate, and which converts measured data obtained by the measuring section, into digital data;

a first optical signal converting section which has a function of converting an electric signal to an optical signal and vice versa and a function of performing communication, and which converts the measured data from the A/D converting section into an optical signal and transmits the optical signal, or converts a received optical control signal into an electric signal;

a second optical signal converting section which has a function of converting an electric signal into an optical signal and vice versa and a function of performing communication, and which converts the measured data from the first optical signal converting section into an electric signal or converts the control signal into an optical signal; and

a displaying section which displays a table or a graph showing the electron energy distribution obtained by the calculating section, and

wherein the calculating section obtains the electron energy distribution in the plasma region on the basis of the measured data given by the second optical signal converting section.

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Claim 15 (New): A measuring apparatus according to claim 14, further comprising a floating capacitance reducing unit which reduces a floating capacitance to ground.

Claim 16 (New): A measuring apparatus according to claim 15, wherein the floating capacitance reducing unit comprises a dummy probe connected to the pulse power supply.

Claim 17 (New): A measuring apparatus according to claim 15, wherein the floating capacitance reducing unit comprises an optical communication unit which performs optical communication to transmit data between the measuring section and the calculating section.

Claim 18 (New): A measuring apparatus for measuring an electron energy distribution in a plasma region generated by a high frequency power, comprising:

a heating probe having a probe portion which is inserted in the plasma region, and is to be heated by application of a pulse voltage;

a pulse power supply which applies a pulse voltage to the heating probe to heat the probe portion to a state that the probe portion can emit thermions;

a measuring section which detects a difference in floating voltage between a voltage period (H level) and a no-voltage period (L level) of the pulse voltage;

a calculating section which obtains an electron energy distribution in the plasma region on the basis of a value detected by a detecting section; and

a floating capacitance reducing unit which reduces a floating capacitance to ground.

connected to ground

Claim 19 (New): A measuring apparatus according to claim 18, wherein the pulse power supply varies a pulse height (H level) of the pulse when applying the pulse voltage to the heating probe.

Claim 20 (New): A measuring apparatus according to claim 18, wherein the measuring apparatus is mounted on processing apparatus for performing one of a film forming processing, an etching processing and an annealing processing, and

the probe portion is attached to a chamber of the processing apparatus, where the plasma region is generated, in an electrically insulated state, and the heating probe is in a potentially floating state.

Claim 21 (New): A measuring apparatus according to claim 20, wherein the chamber is made of insulating material.

Claim 22 (New): A measuring apparatus according to claim 18, wherein the measuring section comprises circuit elements integrated on a substrate, and said measuring apparatus further comprises:

an A/D converting section which is provided along with the measuring section or provided on another substrate, and which converts measured data obtained by the measuring section, into digital data;

a first optical signal converting section which has a function of converting an electric signal to an optical signal and vice versa and a function of performing communication, and which converts the measured data from the A/D converting section into an optical signal and

transmits the optical signal, or converts a received optical control signal into an electric signal;

a second optical signal converting section which has a function of converting an electric signal into an optical signal and vice versa and a function of performing communication, and which converts the measured data from the first optical signal converting section into an electric signal or converts the control signal into an optical signal; and

a displaying section which displays a table or a graph showing the electron energy distribution obtained by the calculating section,

wherein the calculating section obtains the electron energy distribution in the plasma region on the basis of the measured data given by the second optical signal converting section.

Claim 23 (New): A measuring apparatus according to claim 18, wherein the floating capacitance reducing unit comprises a dummy probe connected to the pulse power supply.

Claim 24 (New): A measuring apparatus according to claim 18, wherein the floating capacitance reducing unit comprises an optical communication unit which performs optical communication to transmit data between the measuring section and the calculating section.
